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ICE BREAKER



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EDITORIAL

It's very encouraging to see ongoing media attention to Antarctic and Southern Ocean matters. After the strong public response to June's Midwinter Festival events and efforts by members of the Antarctic community to draw attention to activities that affect both Tasmania and its polar neighbours, it seems the media have registered the public's continuing interest as well. The closer Tasmania is seen to oversee all aspects of Antarctica, the stronger our status as a significant gateway to the south. While other departure points may be increasing their tourist numbers, no other gateway matches the breadth of our Antarctic expertise and industry.

As is evident in the reports from government ministers and the Antarctic CRC in this issue, Antarctic research at the newly titled Antarctic Climate and Ecosystems CRC is now receiving stronger tri-partisan backing, with ministers lobbying the federal government for further funding.

Norman Mackay of Skytraders and Charlton Clark from the Australian Antarctic Division have supplied the latest update on the Antarctic airlink. Charlton has taken over as Project Manager for the airlink from Jo Jacka and Ice Breaker is grateful for their continuing willingness to provide information despite their busy schedules.

Next year will be the 10th anniversary of the founding of the Tasmanian Polar Network and the Office of Antarctic Affairs, and thanks must go to the initiative of Peter Hodgman, who created a Ministry for Antarctic Affairs Portfolio in 1993 and ensured an Antarctic and Southern Ocean Centre was built.

Advertisers this issue will notice a slight increase in charges, but ICE BREAKER reaches a wide range of readers and an advertisement serves as a useful reminder of a company's involvement in Antarctica. Rates are now \$29.70 per quarter page, \$59.20 per half page and \$112.20 per full page, GST inclusive.

Cover: The newly unveiled Bernacchi memorial at Victoria Dock, Hobart.

FROM LARA GIDDINGS' DESK



In 1997 I was fortunate to have been given the opportunity to travel to the Antarctic on a parliamentary delegation. After experiencing first hand the pristine environment and meeting the unique band of scientists and other expeditioners who work there, I came back definitely bitten by the Antarctic 'bug'.

So you can imagine my pleasure when the Deputy Premier and Minister for the Department of Economic Development decided to give me responsibility for Antarctic Affairs.

Antarctic Affairs is not just a personal passion of mine, but also a key issue for Tasmania's future. The State Government knows that Hobart is one of the world's great centres of excellence for temperate marine science and industry, and that our Antarctic community here is a great cultural and economic asset for the state, as well as for our nation. My appointment represents a commitment by the Government to build on these strengths.

Against this background, the State Government has welcomed the opportunity in the last few months to support a range of programs and institutions that are vital for Tasmania's 'Antarctic future'.

By way of example, we have been an active participant for many months now in the new funding bid by the Antarctic Climate and Ecosystems Cooperative Research Centre. Over the past four weeks this has included leading a tripartite delegation to Canberra to advocate on the CRC's behalf to Commonwealth Ministers and their Opposition equivalents, and spending time discussing the bid with all Tasmanian members of Federal Parliament.

The State Government is offering an unprecedented level of support to the bid worth more than \$500,000 in the first three years of the new CRC's operation.

A new conference incentive, the Antarctic Ambassadors Program, was launched recently by the Premier to attract Antarctic related conferences, meetings and symposia to Tasmania. This Program will encourage members of the local and international Antarctic communities to host conferences in Tasmania.

We are pleased that Antarctic enthusiast and former Tasmanian, Tim Bowden was appointed as the first Antarctic honorary Ambassador in this program.

The program is already reaching potential future Antarctic Ambassadors with the launch taking place in the presence of delegates and other local members of the Antarctic community at the recent CCAMLR conference.

Of course, the really exciting thing about the Antarctic agenda is that there is always so much that is just around the corner. Progress with the air link and preparations for next year's Mid-Winter Festival are just two of the issues in which the Government will be taking a keen interest over the coming months.

During this period I look forward to meeting as many of you as possible and will welcome your suggestions on how, collectively, we can continue to position Hobart as the world's pre-eminent gateway to the Antarctic.

Lara Giddings
Parliamentary Secretary on Antarctic Affairs

A MESSAGE FOR ICE BREAKER READERS



LIBERALS WILL CONTINUE TO LOBBY FOR ACE CRC FUNDING

The State Opposition will continue to lobby the Federal Government to fund the Antarctic Climate and Ecosystems Cooperative Research Centre (ACE CRC) given its pivotal role in Australia's program of climate change science.

Located at the University of Tasmania the ACE CRC is seeking a seven-year funding commitment from the Federal Government totalling \$23.5 million and is one of more than 40 CRC proposals seeking funding. Less than half of the proposals will be successful with the successful programs to be announced at the end of December 2002.

The Shadow Treasurer Peter Gutwein was part of a tripartite delegation which lobbied Federal MPs, including Ministers, in Canberra last month in a bid to secure the additional funding.

As well as support from all sides of Tasmanian politics, the ACE CRC also has the backing of key scientific organisations such as the Australian Greenhouse Office and the CSIRO.

Aside from the fact that it employs 50 Tasmanians, the ACE CRC is also important in that it attracts visiting international scientists and conferences to Hobart and is an integral part of the State's Antarctic offer and push to be internationally-recognised as the true gateway to the frozen continent.

Already Tasmania has been chosen as the base for about 16 organisations with a focus on Antarctic - who contribute about \$100 million a year into the Tasmanian economy - and the presence of ACE CRC is just one reason for that. The centre is vital if we wish to attract more such organisations.

Aside from the economic impact on Tasmania the important science being undertaken by the centre cannot be overlooked.

It has rightly been described as the engine room of Australian science on climate change and greenhouse and the work it undertakes is vital to the development of appropriate national policies regarding these issues.

One such example is that the data collected effectively underpins the sustainability of the Southern Ocean krill fishery, already worth \$100 million a year with the potential to return much more over time.

The State Opposition fully supports the State Government's decision to provide the CRC with a full-time commercialisation officer and additional in-kind support.

Both in Government and Opposition, the Liberals have been strong supporters of our links with Antarctic and our support for the ACE CRC is simply a continuation of that position.

Rene Hidding, MHA
State Opposition Leader

PEG PUTT'S MESSAGE



I was pleased to be part of a three party delegation to Canberra seeking funding from the Commonwealth Government for the Antarctic Climate and Ecosystems Co-operative Research Centre at the University of Tasmania for the next 7 years. The current CRC's funding will end in June 2003.

Readers will be aware of the importance of the CRC as an integral part of Tasmania's Antarctic community. Their work on climate change science is important to the nation in tackling the issue of global warming, particularly now that Australia has chosen not to sign on to the Kyoto protocol.

The CRC's work in Southern Oceans research and in meteorology is also very significant for our strategic planning and to inform on future resource usage.

The focus of the funding bid is that the CRC work will not only help Australia to make money by commercialising new technology, but also to save money by informing our decisions on adapting to climate change. In the making money department there is a clear opportunity for spin-off commercialisation objectives to link with the Polar Network.

The bid has made it through 2 rounds of evaluation and the third and final round comprised an expert panel review in late October. The result will be announced in late December when we will hear whether this bid is one of the expected 10-20 successful CRCs from the total of around 40 current and potential CRC's seeking funding.

Whilst you hear much conflict between political parties, it was great to be part of a positive all party initiative to support the continuation of this very important focus of Antarctic science, and to support Tasmania as a place with a specific node of expertise on the Antarctic.

ANTARCTIC CRC ACTIVITIES

The Antarctic CRC has had a particularly successful field season in 2002.

The Amery Ice Shelf project, AMISOR, has been the main topic of study, to determine the present basal melt and freeze rates under the ice shelf and how these may change with future warming. A second borehole was drilled through the Amery Ice Shelf, with a hot water drill, in a location where basal freezing was expected, in contrast to the previous hole where basal melting occurred. Measurements were made through the borehole and the water column and core samples were taken from the bed. Instruments were left in place to record the ice and ocean processes through a complete year.

An oceanographic cruise was carried out in Prydz Bay and along the front of the ice shelf to remeasure the hydrography and ocean currents and also recover the moorings, which were deployed the previous season. The data from these measurements now provide excellent constraints for the modelling and for determining the fluxes of mass, heat and freshwater under the ice shelf.

The modelling of the ocean circulation under the ice shelf by the Antarctic CRC indicates that Antarctic ice shelves are very vulnerable to climate warming from increased basal melting. The results show existing large melt rates at the back of the Amery Ice Shelf although some of the meltwater produced freezes on elsewhere on the ice shelf.

High basal melt rates, and some refreeze onto the base have also been derived from observations, on the surface, and from satellites, of ice elevation, thickness and velocity. It is now recognised that basal melting of floating ice near the grounding line is a substantial component in the mass balance and loss of ice from the Antarctic Ice Sheet. It is now also recognised that the net fresh water flux from under ice shelves forms an important component of the fresh water balance around the edge of the Antarctic, which contributes to the control of deep water mixing and the deep ocean overturning circulation.

(continued next page)

ANTARCTIC CRC ACTIVITIES (continued)

The return of Voyage 1 on 19th November has also proven successful for the CRC. Two of the three moorings put out primarily for biogeochemical research were successfully retrieved, continuous plankton recordings were made, krill trawling was carried out and the sea ice productivity project team collected many days worth of productivity data. The Ice Berg research team completed work on the Strain Gauge Network/GPS and deployed an Antarctic Weather Station (AWS) on Ice Berg B9. The ice radar experiment was tested successfully on a small ice berg (A4) but unfortunately failed thereafter.

And finally, the Antarctic CRC has made it successfully through to the last stage in a new bid application for the current CRC round of applications. Thank you to all CRC colleagues for their best efforts, particularly Tom Trull, in presenting the value of both the existing Antarctic CRC and the proposed future CRC for Antarctic Climate and Ecosystems (ACE).

W. F. Budd
Director - Antarctic CRC

READY FOR ANTARCTICA

Robert Harman's account of preparations for his first working visit to Antarctica.

I guess it's just about everyone's dream to score a trip to Antarctica and that's exactly what I've done. Since I started my Bachelor of Geomatics degree at The University Of Tasmania in 1996, I learned of an opportunity for a final year student to assist a senior surveyor each summer in Antarctica. Since then I have successfully balanced studies whilst gaining as much surveying experience as possible through Sinclair Knight Merz in Hobart and Black Swan nickel mine in Kalgoorlie.

Applications for a five-month summer voyage to Davis were advertised to students around July/August 2002 and as I was currently doing work experience as part of my final semester I thought that it would be difficult to leave work and my wife, Jenny for such a long period. However, circumstances changed and the voyage dates were reduced from five to three months, which seemed ideal.

Life has been particularly busy since being accepted on board. Medicals and psyche tests, clothes fittings and training camps, not to mention all of the personal things that need to be sorted out. Obviously I will miss Christmas, birthdays and other parties with family and friends, but I'll still be in good company with a whole bunch of new friends and enjoying Christmas and New Year's Eve like I've never imagined.

The first thing most people say when you tell them you're off to Antarctica is cool! or do you get seasick? The voyage down there takes 12-14 days from Hobart to Davis and I'm looking forward to it as much as everything else. I do have a weak stomach but I will try my best to enjoy the trip as I imagine boat trips in the future may be replaced by faster aircraft flights.

The surveying work required over the summer includes levelling between benchmarks, downloading tide gauge data, detail surveys and coordinating photo control marks. Davis will be my home for most of the time, however there will also be trips around the Rauer Islands group and also to Zhong Shan and Law Base for more levelling work.

Overall I'm going away with an open mind and look forward to exploring a piece of the world only a select few get to see. Today's technology will allow me to stay in touch with family and friends who will be kept up-to-date with my adventures. I graduate from my Bachelor of Geomatics degree on December 17th which I will obviously miss, however I plan to celebrate with a beer or two 5000 kilometres away surrounded by icebergs and penguins.

Rob Harman
[Editor's note: Robert Harman is the Editor's second cousin]

TPN CHAIRMAN'S MESSAGE



With summer now very close we have seen the usual increase in activities related to Antarctica, the Sub Antarctic and the Southern Oceans around the port of Hobart as people again move south for the season.

The forerunner of this (visible) activity is always the annual CCAMLR international gathering and this year was no exception. Sir Guy Green's hospitality and entertainment was again superb and greatly impressed and welcomed our many international guests.

In this quarter, we have seen the new Director of the Office of Antarctic Affairs starting to make his mark on the role. I am looking forward to working closely with Greg as he does so and particularly the fresh ideas and energy he brings to us in support of the TPN's activities.

I was delighted to hear that Tasmania has been successful in its bid to secure the COMNAP Secretariat in Hobart until 2009 and that Antoine Guichard has been announced to take over next year from Jack Sayers. COMNAP and CCAMLR are essential pieces of the Antarctic jigsaw for Hobart and are 'the keys to many international doors'.

I note that planning is now well underway for next years Midwinter Festival (14-22 June 2003) and acknowledge with pleasure the allocation of \$70,000 towards it by the Tasmanian Government.

For the benefit of all readers, I note an excerpt of the 2002/2003 Strategic Plan as follows.

In 2002/03, the TPN will adopt six key strategies:

- Identify current and emerging demands for Antarctic goods and services with a view to opening new markets and opportunities for internationally competitive Tasmanian firms.
- Promote and improve (capacity building) the State's capacity to satisfy current and emerging demands for cold climate goods and services to encourage higher levels of spending and investment in Tasmania, including by attracting new nations and organisations to establish their Antarctic bases in Hobart.
- Work closely with institutional members to identify new opportunities for commercialisation of Antarctic R&D.
- Increase the profile of Hobart's Antarctic community among the general public to encourage a greater sense of public ownership and pride in the State's Antarctic links and history and its associated firms and institutions.
- Encourage a sense of community between members of the Network and a spirit of cooperative competition to optimise the collective Tasmanian 'pitch' for new cold climate business.
- Promote the benefits of TPN membership to a wider range of Tasmanian organisations as a means to increase the overall influence and prominence of the network within Australia and globally.

These items represent an excellent summary of 'where we are going' and provide a good reflection at year's end, I think.

Finally I wish all TPN Members a very merry Christmas and a Prosperous New Year.

Bill Lawson. Chairman, TPN.
November 2002.

AIRLINK SKI PROGRAM UNDERWAY

Skytraders, the Sydney based preferred tenderer for the provision of Tasmania's Antarctic Airlink, confirmed recently that they have now concluded contracts with the Australian Antarctic Division for the design and construction of skis for the CASA 212.

"This marks a major milestone in the development of this exciting project," said Norman Mackay, the company's C.E.O. The 212 proposal is a vital component of the program and will result in world-beating performance standards for ski-equipped aircraft.

The skis will be designed and built by the Canadian company Kehler Skis who will work in conjunction with Aeronautical Engineers Australia, an organisation with 25 years experience in aircraft design and engineering. Winnipeg based Kehler has been responsible for the construction of some 22 types of aircraft skis used on 25 types of aircraft. Most recently they developed equipment for the Cessna Caravan, a modern turbo-prop aircraft popular with carriers servicing the Inuit reservations far above the Arctic snow-line.

Skytraders' announcement follows visits to Australia by senior executives of the Spanish EADS/CASA company who will be responsible for the manufacture of the two long-range high performance aircraft. A team comprising representatives from the design office in Madrid accompanied AAD and Skytraders personnel to meetings with the Civil Aviation Safety Authority in Canberra. Detailed discussions resulted in the Regulator defining the conditions which will be applied to certification of both the aircraft and its associated equipment. Current projections will result in the first aircraft coming off the production line in August 2003 and deployment in Antarctica around two months later upon completion of the certification process.

Conditions agreed with the Regulator mean that Skytraders will never be allowed to sell tickets on its aircraft to individuals wishing to travel around Antarctica. Whilst its contractual agreement with the Antarctic Division will restrict flights strictly to the AAD and associated international science personnel, the company has agreed with CASA that the licences issued will ensure that the operations can never become the ultimate getaway for wealthy tourists.

"It is not possible to be to be all things to all people," said Mr. Mackay, "Our mission is to build an air system which will provide the platform for a dramatic improvement in Antarctic science. Programs such as that involved in the monitoring of global climate change demand that world-class scientists can travel to and from the region quickly and efficiently. The current shipping system with its potential for weeks trapped in ice inhibits vital scientific research. Tourists can experience Antarctica on regular Qantas overflights. Those wishing to step ashore on the frozen wilderness can do so using one of the many Peninsula based operators. The reality is that Eastern Antarctica offers neither the flora nor the wealth of wildlife readily available to those accessing the continent via South America."

This exciting development in the Airlink program brings with it a further move to ensure that the technology which is developed will have the maximum possible Australian content. AEA is a recognised leader in the Regional Aerospace industry, having taken aircraft from initial concept development through design and construction to final certification. Whilst Antarctic mission requirements have in the past caused carriers to operate at weights well in excess of manufacturers' limitations, the Australian program will address safety in a manner not previously considered possible. Operating ranges will increase by up to 300% with useable payloads improving by a similar amount. The aircraft's drop tail configuration presents vastly improved access and general utility whilst state of the art digital avionics ensure that pilots have the most accurate information available to them with which to make the most informed operational decisions.

Most intra-Antarctic ski-equipped personnel transport systems feature the De Havilland Twin-Otter, which ceased production some twenty years ago; the legendary DC3; or military Hercules built in the 1960's. All excellent aircraft in their day but not reflective of the modern developments in aircraft design which are an essential part of operations in one of the most hostile aviation environments on earth, argue Skytraders.

International science program operators are watching this exciting Australian initiative closely and Skytraders believe that it will not be long before they see foreign nations join the Airlink program.

OFFICE OF ANTARCTIC AFFAIRS



Bill Bleathman warned me to expect a baptism of fire when I joined the Office. Eight weeks later and following a major product launch, a two-week CCAMLR meeting, interviews as part of the Antarctic CRC bid team and a host of functions with visiting dignitaries, his words have proven quite prophetic!

Much of the Antarctic community's time in recent weeks has been taken up with the CRC bid, with organisations including CSIRO, the Australian Antarctic Division and this Office all participating on the bid team.

From the State's point of view, it is essential that the new Antarctic Climate and Ecosystems CRC receives Commonwealth funding over the next seven years. Failure to fund this critical organisation would not only pull at the heart of Hobart's Antarctic community, but also cast doubt on Australia's commitment to greenhouse abatement. While the CRC's work will *make* Australia a little money through commercialisation, it will *save* Australia much more by informing our response to climate change, a billion dollar business in itself.

The last few months have also seen a major period of review by another of Hobart's Antarctic stalwarts – CCAMLR. The Commission's annual meeting took place in late October/early November, and brought almost 200 international scientists and ambassadors to town. OAA represented the Australian States and Territories on the Australian delegation. With *4-Corners* lifting the organisation's public profile through a major story on toothfish, the debate was particularly intense on issues associated with illegal, unreported and unregulated fishing.

Throughout this period the Office has been active on a range of other fronts associated with lifting the profile of Tasmania's Antarctic 'offer'. In no particular order, the Office has worked with Government to:

- Launch a new conference incentive scheme aimed solely at the local Antarctic community and inaugurate Tim Bowden as Tasmania's first Antarctic Ambassador;
- Host functions for the Ambassador of the European Union and the Consuls General of both the United States and China; and
- Brief members of the local Estonian community on the proposal by Estonia to establish a small base in Hobart for its future Antarctic operations.

Planning is also proceeding apace on next year's Mid-Winter Festival, with Ben Galbraith in particular burning the midnight oil to develop the Festival over the next three years into a first rate international tourist attraction. Some exciting announcements associated with next year's event are just around the corner.

Of course, all this work would not be possible without the active support of Tasmania's dynamic Antarctic community. And to all of you who have welcomed me into the fold and lent such great support to the new boy on the block – thank you.

Greg Johannes
Director, Office of Antarctic Affairs



TPN ELECTIONS

At the Tasmanian Polar Network's Annual General Meeting in September, eight members were elected to the TPN Committee. These were:

- **Bill Lawson**, Sinclair Knight Merz, - Chairman,
- **Richard Fader**, Tasmanian Shipping Supplies – Senior Deputy Chairman,
- **Wayne Tucker**, Hobart International Airport – Deputy Chairman,
- **Greg Johannes**, Office of Antarctic Affairs – Secretary,
- **Tony Hughson**, Antarctic Consultant – Treasurer and Committee Members:
- **Rodney Cameron-Tucker**, Antarctic Adventure,
- **Geraldine Edwards**, Moonraker Australia,
- **Anthea Wallhead**, Malcolm Wallhead and Associates.

ANTARCTICA FEATURES

Next year's 'Ten Days on the Island' festival includes several events with an Antarctic or Southern Ocean theme. 'The Antarctica Concert' on March 30, 2003, features the Tasmanian Symphony and Australian Youth Orchestras. 'Breaking the Ice' (28 March –18 May) is an exhibition of Antarctic artwork by Jorg Schmeisser. 'Home of the Blizzard' (29 March) is a vocal performance by Antigone Foster based around a movie of Hurley's Antarctic images. 'The Nature of Islands' (24 March-25 May) is an exhibition of botanical artists' work which includes flora from Macquarie Island. For further information about the Festival, phone 1300 661 633. Copies of the full program are also available at branches of the State Library of Tasmania.

WEATHER CALENDARS

Bureau of Meteorology 2003 Calendars are now available and are on sale at Antarctic Adventure, Salamanca Square, Hobart.

COOL SQUID

The first permanent display of a giant squid is being prepared at the Tasmanian Museum and Art Gallery. Expected to be ready by Christmas, the 10 metre long squid will be housed in a 3 metre long refrigeration unit, where it will be set in a realistic pose, then gradually frozen in sculptor's ice, which sets clear. Previously, squid were partially defrosted for public viewing, but no air bubbles or 'clouding' occurs in this particular ice.

BERNACCHI MEMORIAL

Antarctic-related sculptural works in Sullivan's Cove were augmented recently with the unveiling of bronze sculptures of Louis Bernacchi, some of his exploration equipment and dog team. Donated to Hobart by James Bleasel, former Director of the Australian Antarctic Division, and his wife Margaret, the sculptures by Stephen Walker stand close to Victoria Dock, the point of departure for Bernacchi's 1898 expedition. In the water behind these sculptures are those of the recently cleaned seals and penguins, which now benefit from regular water sprays to reduce seabird droppings. While Mawson Place remains bare of obvious Antarctic features, this part of Victoria Dock now holds significant reminders of Hobart's polar and Southern Ocean connections.

SECRETARIAT SECURED

Tasmania has been reselected as the base for the Council of Managers of National Antarctic Programs (COMNAP) for another 6 years. Despite submissions from New Zealand and Italy, delegates at the COMNAP meeting in Shanghai in July voted to retain the Secretariat in Hobart. Ably managed by Jack Sayers for the past 6 years, a new Secretary will take over the responsibility in 2003.

ANALYSING ANTARCTIC WASTE

Steve Jarman, Australian Antarctic Division, is developing a pioneering method of estimating the quantity of krill consumed by whales and other sea creatures, without having to kill them to examine their stomach contents. The latter method is used by the Japanese despite protests. By using DNA technology, Dr Jarman and two of his PhD students are identifying the DNA profile of krill, squid and other fish, then examining whale, penguin and seal poo to discover the proportion of consumed krill. Although there are problems in the collection and analysis of this waste, Dr Jarman expects his DNA 'fingerprinting' will assist CCAMLR in their management of fish stocks, as well as providing an alternative to whale 'culling'.

WARMING WARNING

Thousands of Antarctic species, essential food for larger creatures, are being threatened by global warming. A water temperature rise of 2-degrees C is enough to cause extinction of sensitive creatures such as sea spiders, sandfleas and small molluscs.

ANTARCTIC ADVENTURE



I have recently had the opportunity to spend a week in Hobart's Sister City, Yaizu, Japan, with an official Hobart City Council delegation then the opportunity to spend an additional two weeks visiting relevant attractions in other parts of the country, such as the Shirase Antarctic Museum in Konoura. My trip to Japan was followed by a stopover in Singapore to meet with International Inbound Tourism Operators.

The Japanese were very interested in the games we have produced in conjunction with Tasmanian multi-media company, Tweezy. They were particularly interested in the latest penguin game. I was equally impressed with what I saw and was able to develop strong connections which I am confident in the future will result in some exchange of technology and information.

The Tokai Marine Science Centre has an amazing mechanical aquarium which gives the visitor an interactive experience and a better understanding of Antarctic marine life.

In Singapore I was able to meet major international tourism operators who organise tour groups to Tasmania and re-establish a vital link with the Asian market.

I am confident my trip will positively impact on Antarctic Adventures and indeed greater Hobart's travel and tourism industry.

Rod Cameron-Tucker
Director, Antarctic Adventure

Below: One of the polar exhibits at Shirase Antarctic Museum, Japan (Photo: Rod Cameron- Tucker)



NEW POLAR PERMITS

Legislation to support Customs modernisation of its cargo management systems was introduced on 1 July this year. The unintended effect of these changes threaten to impact on the operations of the Tasmanian Antarctic Industry, effectively reducing the State's capacity to supply a range of "prescribed goods" supplied to Antarctic regions.

The Office of Antarctic Affairs (OAA) and affected members of the Tasmanian Polar Network (TPN) lobbied both the Australian Customs Services (ACS) and the Australian Quarantine Inspection Service (AQIS) seeking industry wide solutions to these issues.

Both the ACS and AQIS provided timely solutions before the commencement of the 2002 Antarctic-shipping season. Customs provided a ruling clarifying that the Australian Antarctic Territory, for the purposes of the relevant Acts, is considered to be an external territory, which in effect mitigates many of the permit requirements for a range of "prescribed goods".

For export of goods to non-Australian Antarctic Territory, including international Antarctic stations located in Australia's Antarctic Territory, there is provision for special exemption from AQIS to export to those Territories without the need for permits. Each individual exporter is required seek a special exemption, however, this is granted for a 12-month period. Special exemption requests should be directed to Mr Steven Roberts at AQIS. He can be contacted by on phone: (02) 6271 6522 or by e-mail: steven.roberts@aqis.gov.au. For further information contact Ben Galbraith, Executive Officer, OAA.

An overview of key changes affecting exporters is outlined in a brochure "Exporters 1 July 2002" produced by Australian Customs Service and available from Australian Customs Information Centre by phoning 1300 363 263.

Ben Galbraith, Executive Officer, OAA.

OCEAN FRONTIER'S ANTARCTIC PLANS

Australia-based tour company Ocean Frontiers plans to return to the Ross Sea in mid-December with its 37-m vessel 'Sir Hubert Wilkins' to support a month-long diving and filming program in the Cape Adare region. News of the voyage, which is being sponsored by a Japanese television channel, comes seven months after the ship was advertised for sale.

Reports indicate that the television company has been working on a major documentary on Antarctica for some time and that filming has already been undertaken elsewhere on the continent. The focus of the forthcoming voyage is believed to be on obtaining underwater footage of icebergs, animals and other life in the pack-ice zone: an extensive scuba-diving program is planned in support.

A diving chamber and other associated support equipment installed on 'Sir Hubert Wilkins' earlier this year for an expedition to the Philippines at a cost of \$US250,000 is understood to have been a key factor in the selection of the vessel for the filming operation.

The forthcoming voyage will be the ship's fourth to Antarctica and its second to the Ross Sea. It first visited Ross Island in February 2001 to pick up adventurers Ann Bancroft and Liv Arnesen following their unsuccessful attempt to cross Antarctica.

'Sir Hubert Wilkins' is currently scheduled to leave Hobart, Australia, on 1 December with up to 24 people on board and return there around 15 January. Operations in the pack-ice zone near Cape Adare are expected to begin around 10 December and continue until about 6 January, a period when significant amounts of ice are still normally found in that region. Although ice strengthened, the ship has no significant ice-breaking capability, although a single-engined Hughes 300 helicopter is to be carried on the voyage for ice reconnaissance and other support.

The ship is still for sale and Don McIntyre, Ocean Frontier's principal, expects it to be sold by next February.

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POLAR LINGUISTICS

Researchers attending the Inuit Circumpolar Conference at Quebec, Canada, have revealed that people from Greenland, Alaska, northern Canada and Russia have 3 different alphabets. In order to record what was originally a single, oral language called Inuktitut, Western missionaries introduced different scripts to different areas, including the syllabic system and Cyrillic script. Delegates at the conference will decide on a single alphabet so that all Inuits can understand each other's writing.

TOOTHFISH PROTESTS

Greenpeace activists concerned that the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) was not effectively monitoring the illegal fishing trade in Patagonian toothfish, staged demonstrations during CCAMLR meetings this year. The Totem Pole, a 65 m dolerite formation off the Tasman Peninsula, was scaled and a giant banner erected, and at the Wrest Point Convention Centre, other members representing Commission delegates slept in a bed under a cover decorated with toothfish bones and were woken by a mock newsflash reporting toothfish piracy.

Improved ship identification methods and a centralised satellite-based system in Hobart are being considered by CCAMLR delegates, but Australia's bid to list the toothfish as an endangered species was rejected.

ANTARCTIC SCHOLARSHIP

A University of Tasmania Zoology Department student, Kate Cresswell, has been awarded a British Antarctic Survey (BAS) PhD Scholarship. She will spend several months on South Georgia Island to study behavioural interactions between penguins and krill, and the rest of her 3 years at Cambridge, UK.

HUSKIE TRIPS

Sledding holidays are available in the Yukon, Canada, between November 23 2002 and April 5 2003. For further details on the 8-day dog-sled trips, contact Travel Associates (1800 044 066)

NEW REFERENCE

A register of 600 Tasmanian manufacturers, including some members of the Tasmanian Polar Network (TPN), was launched in October by the

Deputy Premier Paul Lennon. The 2002 Tasmanian Manufacturers Capability Register is online at www.dsd.tas.gov.au/manufacture_services.html. The Register allows searching by alphabetical listing, industry sector, category, region and export market.

AURORA STAMP

Canada Post has produced a new series of stamps highlighting Northwest Territories, including a photo of an aurora borealis. For further information, contact www.canadapost.ca

POLAR FOCUS

ABC TV News is certainly taking notice of Antarctic and Southern Ocean activities, with 3 different news items being included on one evening news broadcast recently.

EASTERN AWARDS

The City of Clarence Business Excellence Awards featured in the November edition of the National Business Bulletin. Included was TPN members Collex Pty Ltd, the winner of the Corporate Citizen's Award 2002.

WHALE COMMENTS

In October this year, the Australian Antarctic Division invited public comment on an application for a 5-year permit to allow satellite tracking of baleen whales to determine their seasonal movements in Australian and Antarctic waters.

SEAL AWARD

Dr Mark Hindell, from the University of Tasmania's Antarctic Wildlife Research Unit, has received the Australasian Science Award for his elephant seal research on Macquarie Island. The award was presented only 2 weeks after the Premier of Tasmania banned invasive research on the seals, which meant Dr Hindell and his team were unable to continue their work this year.

MOVES TO CSIRO

Pru Bonham, former Deputy Lord Mayor of the Hobart City Council, did not seek re-election this year and will restart her earlier career as an algal biologist with the CSIRO in Hobart.

Mike Pook, Meteorologist for the Antarctic CRC and popular weatherman for ABCTV, is resigning to become a research scientist at CSIRO next year.

OUR FIRST ANTARCTIC EXCELLENCY

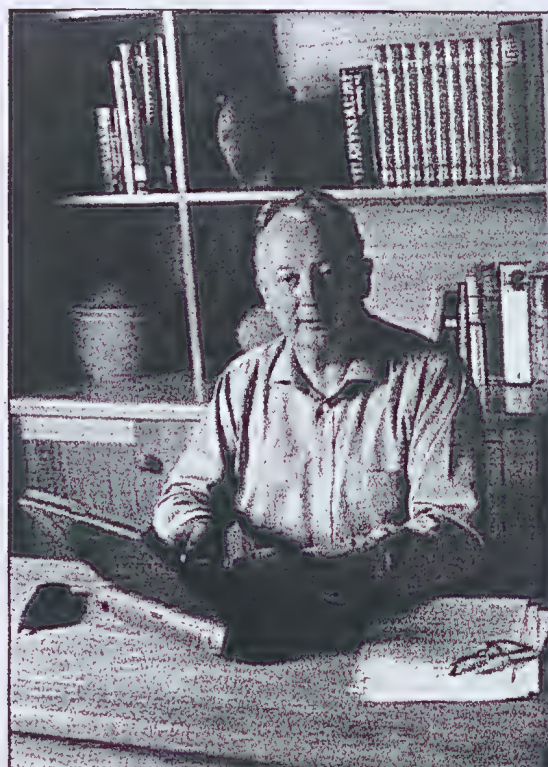
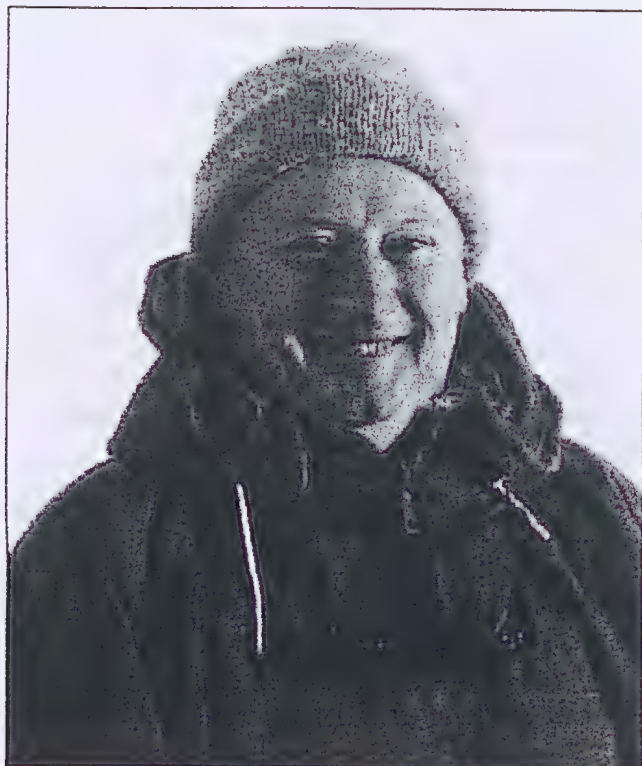
The launch of the Antarctic Ambassadors Program was held at the Wrest Point Convention Centre on October 28, 2002. Tim Bowden was officially named as Tasmania's first Antarctic honorary Ambassador, and the event was attended by the Premier, Jim Bacon; the new Minister for Antarctic Affairs and Deputy Premier, Paul Lennon; Parliamentary Secretary for Antarctic Affairs, Lara Giddings, members of the Antarctic community and visiting delegates for the CCAMLR meeting.

A broadcaster, journalist, radio and television documentary maker, oral historian and author, Tim Bowden was born in Hobart, is married with two children, and now lives in NSW. His background in journalism includes current affairs, news, and feature and documentary work. For his services to public broadcasting, Tim received an Order of Australia in June 1994, and in May 1997 he was awarded an honorary degree of Doctor of Letters from the University of Tasmania.

For the last decade Tim Bowden has been actively broadcasting, writing and researching Australian activities in Antarctica. He has produced six radio documentaries **Australians in Antarctica** in 1987, and his six half-hour documentaries **Breaking The Ice** were broadcast on ABC-TV in 1996. They have since been released on ABC Video. In 1993 he was commissioned by the Antarctic Division to write the official history of ANARE (Australian National Antarctic Research Expeditions) entitled **The Silence Calling - Australians in Antarctica 1947-97**, which was published on 11 June 1997. He also wrote and narrated the ANARE Jubilee Documentary **The Silence Calling**, broadcast in June 1997, drawing on previously unseen archival footage from the Division, filmed oral history interviews he has recorded with key expeditioners, and contemporary material filmed in Antarctica.

The Antarctic Ambassadors Program is a joint initiative of the Office of Antarctic Affairs (OAA) and the Tasmanian Convention Bureau (TCB). The program encourages members of the local Antarctic community to bid for and/or host Antarctic related conferences, conventions and symposia in Tasmania, and direct administrative and financial assistance will be provided. If you are interested in becoming an Antarctic Ambassador, contact Ben Galbraith, OAA, on 03 6233 5672 or Ben.Galbraith@oaa.tas.gov.au, or Amanda Askey, TCB, on 03 6224 6852 or aaskey@tasmania-conventions.org.au

Below: His Excellency, Tim Bowden, in Antarctica (l) and at work on another article (r).



IGLOO SATELLITE CABINS: YEARS 16-20

2002 marks the twentieth year since the first fibreglass Igloo Satellite Cabin was designed and manufactured in Kettering, Tasmania, by Malcolm Wallhead. Although Malcolm died as a result of an accident in October 2000, Igloos continue to be manufactured according to his specifications and exported all over the world. Between 1998 and 2002, Igloos were used for an even greater variety of purposes. (Continued from Issue 20)

IGLOOS NO.113 TO NO.137, 1997-2002

Two extended Igloos were ordered in 1997 by the Alfred-Wegener-Institute in Germany, taking their total to 13, the highest number of orders from an overseas institute. These two were shipped to South Africa for collection and shipping to Antarctica. In contrast, Igloo No.115 did not have to travel so far. This extended unit was manufactured for the new Antarctic and Southern Ocean Centre in Hobart and delivered by truck to Salamanca Square, where it was assembled on site within Antarctic Adventure. Having an assembled Igloo on permanent display in Hobart continues to be of great benefit to the business, and several sales have followed after potential purchasers were able to view the Igloo set up as if in Antarctica.

The next two Igloos served a very different purpose. NQEA Australia Pty Ltd, in north Queensland, had won the tender to construct two new Hydrographic Survey ships for the Australian Navy, and required tropicalised versions of Igloos which could be assembled on atolls in the vicinity of the ships while they were surveying a particular area. Air-conditioned and equipped with computers which received the survey reports as they occurred, these white Igloos were the first to be subjected to accreditation. This potential problem was overcome to some extent by MW&A being the sole supplier of a patented product, but every item and accessory, fibreglass or non-fibreglass, was thoroughly scrutinised by NQEA and extra instructions for assembly, maintenance, repair and replacement of all components were sent with the consignment.

Tasmania's Parks and Wildlife Service purchased the next 3 Igloos. The first, a basic unit in 'Cashmere Beige' was required as a bushfire lookout in the Lake St Clair National Park and was fitted with 7 tinted windows with window shade hoods. Green Igloos 119 and 120 were ordered by the Nature Conservation Branch for use on Macquarie Island and played a part in the eradication of feral cats.

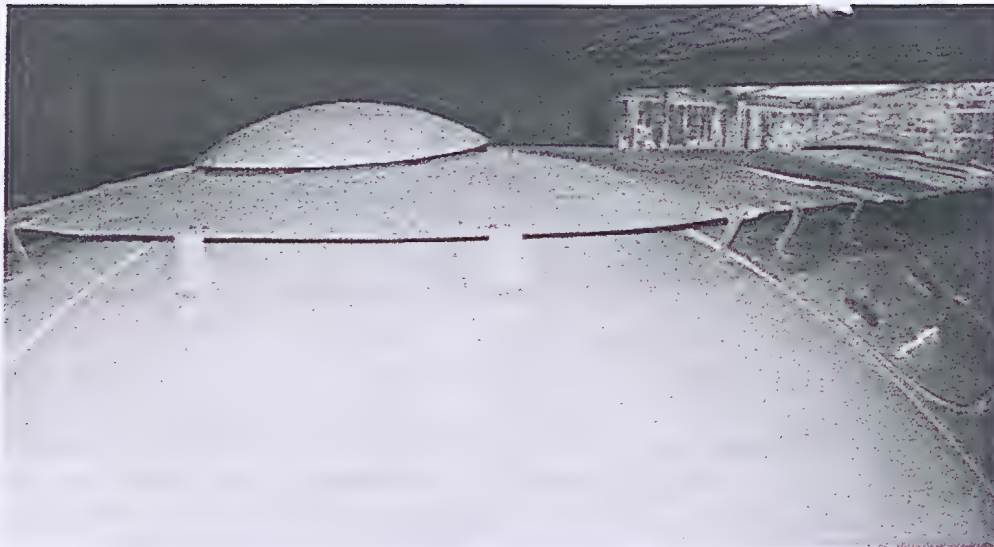
PATENTS

The Igloo Satellite Cabin is patented in 5 countries – Australia, UK, Germany, USA and Canada. With the assistance of a Patent Attorney, the Igloo has been described in such a way to make it unique in comparison with other dome-shaped buildings. The most difficult country for Patents was USA, where Patent Offices can collate several similar Patents, not just one, as proof that a new product is not unique. The first application was rejected and it was only when additional information was sent to USA from Rod Ledingham, then Field Equipment Officer for the Australian Antarctic Division, that the second submission was accepted. Rod happened to be en route to Antarctica aboard the *Nella Dan* when MW&A contacted him to provide this information and his efforts to assist with achieving a Patent were much appreciated. Maintaining Patents has meant regular annual payments which have varied with fluctuating exchange rates and when West and East Germany united, Igloos gained greater coverage but at extra cost! To date, the Igloo has not been directly copied in order to compete with MW&A.

Japan's National Institute for Polar Research ordered a red, extended, polar Igloo in late 1998 and British Antarctic Survey ordered their first Igloo, with 3 sets of extension panels, at the same time. Then came the big order: 6 blue extended Igloos for the Chilean Air Force, to be set up as winter quarters in Antarctica. Five of the Igloos were to be interlinked by tunnels and the sixth unit was to be separate and used for showers, toilets and washing facilities - the first Igloo. Consultation with the Antarctic Division ensured these items complied with Madrid Protocol recommendations regarding waste disposal and it is hoped that the Chileans also complied. All panels, furniture and accessories were numbered and stacked into 2 shipping containers for transport to Santiago, Chile in December 1998 and a favourable exchange rate with the US Dollar made this order the largest ever.

Igloos No. 129 and 130 were both sent to New South Wales in 1999 for 2 divisions of the National Parks and Wildlife Service in that state. A polar Igloo was ordered for the Mt Kosciuszko area and a tropical Igloo

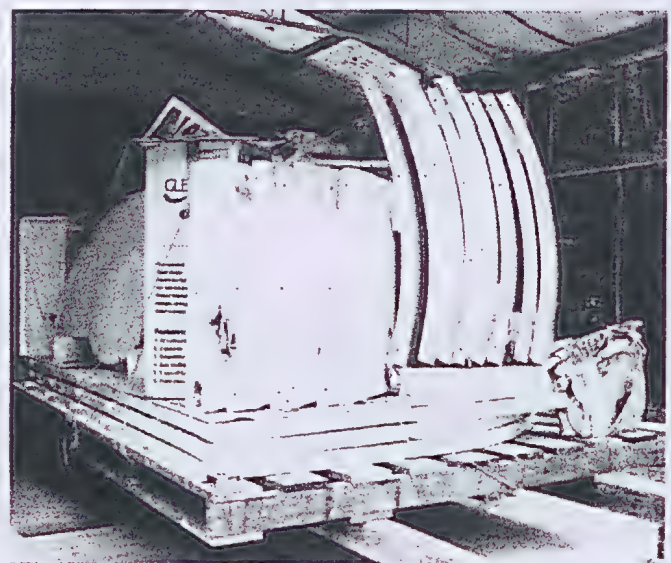
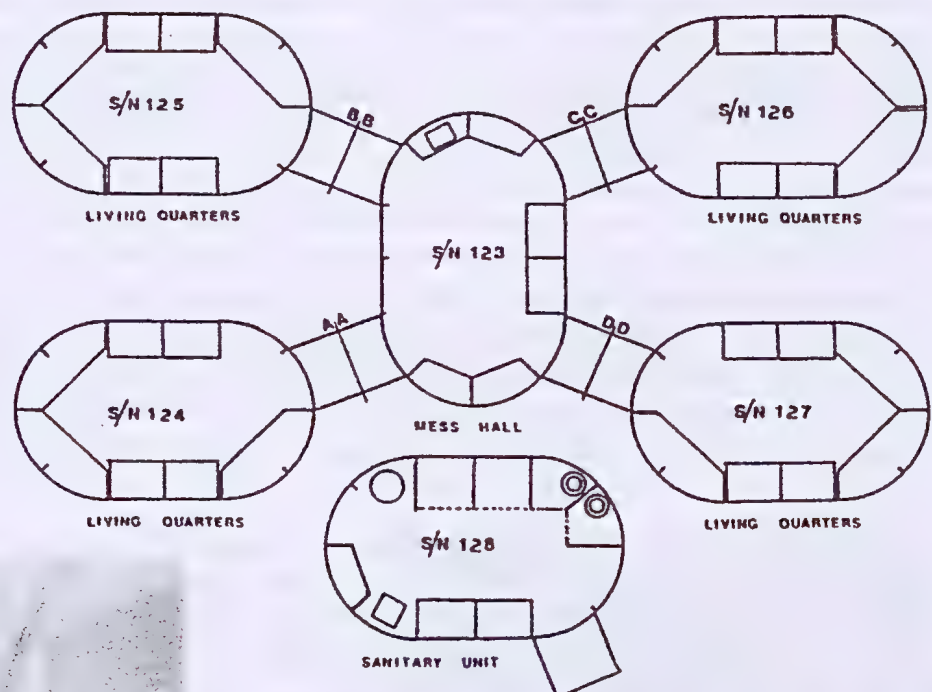
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Left:
Extended roof
section of
tropicalised Igloo.

Below right:
A pallet full of
panels and parts
for an extended
tropicalised Igloo

Plan of Chilean base showing living-working units with extra doors for outside access, interlinking with mess hall. The separated sanitary unit contained basic showers, toilets and washing facilities (see below)



Continued next page >

for use on Lord Howe Island bird observations. Also in 1999, the Tasmanian Parks and Wildlife Service ordered a 'light olive' Igloo for use in the Lake St Clair area.

Originally made for stock and used as a display unit at the ISCORD Conference held at the Hotel Grand Chancellor in Hobart in late 1999, Igloo No. 131 was one of 2 Igloos ordered by a Spanish polar institute in 2000. One red and one blue Igloo were purchased by a delegate who attended the COMNAP meetings in Japan in July of that year. A green Igloo, the last one ordered and dispatched only days before Malcolm's death went to the Cocos (Keeling) Islands, although panels for another red Igloo had been made for stock. This Igloo was completed in 2001 and sent to the same Spanish institute who had ordered the previous year, and with the assistance of local fibreglassers and regular suppliers of goods and services, MW&A continued to supply Igloos when required.

MODIFICATIONS

Moulds and casts

Like any moulds made for mass production of products, fibreglass moulds have a limited life. Several sets of moulds were made over this time, each with small changes designed to make releasing the panels from the moulds easier. Wall panel flanges were modified so that one side of a panel tucked into the next, thus reducing draughts. Although plastic 'bolts' of different sorts were considered to enable faster assembly of the wall panels, stainless steel nuts and bolts continue to be used as they provide a more durable securing system, particularly when Igloos are flown by helicopter.

Floors, windows and doors

Joining the floor panels together progressed from steel to aluminium plates bolted or riveted on, to thick blocks of solid fibreglass bolted both sides of each join. The surface of the floor panels, at first smooth, was textured to reduce slipperiness caused by melting snow from expeditioners' boots. Windows improved from single sheets of polycarbonate to double glazed polycarbonate, attached in place by a window ring. Igloo doors were remade after the first Igloo so that each fitted flush with the door panel and the hinge-line designed to allow the door to open widely. Originally, refrigerator door handles were imported from USA, but were not suitable for the thickness of the fibreglass, so door furniture was designed by Malcolm Wallhead and cast in bronze at a Hobart foundry.

Materials

Frequent suggestions to include Kevlar and carbon fibre in the Igloo were considered, but rejected partly because the greater cost would raise the price of Igloos beyond the limited budgets of the majority of polar institutes. As well, these materials would have made the Igloo lighter but stiffer, characteristics often unsuitable in high winds (ref. yachts' masts in the Sydney-Hobart race). The slight flexibility of standard, reinforced fibreglass, has allowed Igloos, with all tie-down lines secured to the ground, to better withstand winds of up to 300 km/h (ref. the Igloo at Commonwealth Bay, one of the windiest places on Earth). Igloos have been dropped accidentally from helicopters, have collapsed in a landslide, or in blizzard conditions, been blown away when partly assembled, when insufficient tie-down lines have been secured, or when other debris has hit them. The use of more expensive materials would not have ensured their survival in these circumstances.

The most 'patriotic' Igloo was No. 136. Coloured green with 'gold' doors and window rings, this Igloo was ordered by the School of Physics at the University of New South Wales for astrophysical observations near France's Dome C in Antarctica. Sent to NSW in 2001, this Igloo with 4 sets of extension panels has now been fitted with equipment and will be shipped to Antarctica aboard L'Astrolabe, then transported to Dome C this summer. The fourth Igloo for the Spanish institute was manufactured in 2002 and shipped to Barcelona in July 2002. A total of 25 Igloos were completed during these last 6 years.

There have been several other enquiries, but no orders, for new Igloos this year. However, Igloo panels are currently being used for something completely different! Visitors to the new facilities at Bellerive will see a large replica of a cricket ball containing shelves holding cricket memorabilia. This replica cricket ball was made from Igloo panels with the gelcoated side inside and the sprayfoamed coating outside.

Over the twenty years of Igloo manufacture, 69 units have been made for Australian purchasers, including 49 to the Australian Antarctic Division. Overseas institutes have purchased 68 units, the majority for use in Antarctica, and at least 112 have been used by expeditioners from 16 countries for various periods of time on the Antarctic continent or sub-Antarctic islands. Although it is expected that the manufacture of Igloo Satellite Cabins will soon be carried out by another Tasmanian company, achieving and coping the diversity of orders received by Malcolm Wallhead and Associates will be a challenge not every business can emulate.



MARITIME CHANGES

The Maritime Museum of Tasmania has made constitutional changes that return it to being a volunteer organisation, so that members of the public can play a more active role in the museum. Full membership costs \$27.50 per year. For further details, contact maritimetas@bigpond.com.

THIS YEAR'S OZONE HOLE

Researchers at the National Oceanic and Atmospheric Administration report that the ozone hole over Antarctica has split in two and is smaller than it has been over the past 6 years.

SOUTHERN ACTION

For the first time, residents of Antarctic bases participated in games of ice cricket, golf, volleyball or 5 km runs to celebrate Active Australia Day on October 27 this year.

NEWEST RECEIVER

Five thousand computerised, electronic detectors will be installed in Ice Cube, the National Underground Science Laboratory due to be constructed deep below the South Pole by USA researchers. The buried detectors will emit flashes of blue light when hit by neutrinos, tiny sub-atomic particles that travel at almost the speed of light. Telescopes on land or in space cannot detect neutrinos because of cosmic radiation, but Ice Cube will use the Earth as a shield to block these rays so the neutrinos' origins can be traced and mapped. (<http://neutrinooscillation.org>)

MACQUARIE ISLAND PLANTS ON SHOW

Publicity about the Sub-Antarctic Plant House at the Royal Tasmanian Botanical Gardens has been increasing since its recent second anniversary, with the facility being included in RTBG's 'Explore the Gardens' tours. As well, a display entitled 'Edge of the World', featuring some of Macquarie Island's vegetation, received a Silver Prize at the 'Gardening Australia Live' show in Sydney this year. The plant display was also at the recent Royal Hobart Show.

MIDWINTER PUBLICITY

The September issue of AURORA, the ANARE Club Newsletter, featured ten pages of information about Tasmania's Midwinter Festival, including Sir Guy Green's Inaugural Phillip Law Lecture.

TASMANIAN WRITER'S AWARD

Congratulations to Danielle Wood, journalist for The Mercury newspaper, who won the Australian/Vogel Literary Award for her book 'The Alphabet of Light and Dark', a novel based on her great-great-grandfather's time as lighthouse keeper at Cape Bruny. Danielle specialises in articles about Antarctica and the Southern Ocean.

ANTARCTIC OVERFLIGHTS

University of Tasmania scientists are collaborating with the Antarctic CRC to develop a remote controlled aeroplane able to gather data for Antarctic climate models, thus saving time and the expense of using helicopters and fixed wing aircraft. The unmanned aerial vehicle (UAV), made of composites, will have a wing-span of 2 metres, and is designed to cope with winds and ice problems. Other equipment includes air-speed and altitude sensors as well as ultrasonic sensors and a GPS. Trials in Hobart and the Central Highlands will be undertaken before testing is carried out at Casey Base.

UNDERWATER VISIONS

The National Oceans Office in Hobart has produced a 6 minute video of computer generated models of the sea floor, showing sea mounts, trenches and ridges around Macquarie Island, Tasmania, South Australia, southern New South Wales and Victoria. For further information, contact: office@oceans.gov.au.

COMPUTER ADVANTAGE

A new computer system recently acquired by the University of Tasmania will enable researchers to conduct better numerical modelling of oceans and atmospheres. This is particularly relevant to climate changes and other environmental issues in Antarctica.

MOVING NORTH

TPN member, Marie-Paule Leroux, has sold her business, Exquisite Flavours, and will join her husband at the Mount Cotton Estate in Queensland.

PARK OF CLONES

An Ice Age Park is being planned in northeastern Siberia and Japanese scientists hope to use cells from a preserved mammoth to create a living one. An Indian elephant will be the surrogate mother.

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BOOKS:

‘THE HORIZONTAL EVEREST: EXTREME JOURNEYS ON ELLESMERE ISLAND’ by Jerry Kobalenko. Published by Penguin books Canada. Price: Unknown.

Includes historic investigations, tales of tragedy and survival and personal accounts of High Arctic treks.

‘THE RACE TO THE WHITE CONTINENT: VOYAGES TO THE ANTARCTIC’ By Alan Gurney. Published by W.W. Norton. Price: \$24.95.

An account of voyages to the south, from Captain James Cook’s distant view of the continent onwards.

‘VOYAGES OF DELUSION: THE SEARCH FOR THE NORTHWEST PASSAGE IN THE AGE OF REASON’ by Glyn Williams. Published by HarperCollins. Price: \$29.95.

Includes detailed accounts of James Cook’s and Jean Francois Galaup La Perouse’s failed attempts to find a northwest passage as well as mentioning the personal feuding, political and social contexts of these and other attempts through history.

‘PETER BLAND: A STEP TOO FAR’ by Richard Yallop. Published by Pan McMillan. Price: \$30.

Recounts the planning and achievements of the expedition across the Antarctic Peninsula by Jay Watson and Peter Bland, who nearly lost his life when caught in an avalanche.

ANARE FLIGHTS

(with apologies to Banjo Patterson’s ‘The Man from Snowy River’)

There was movement at the station for the word had passed around
that the plane from Hobart, Tas. was on its way.

It was full of eager scientists flying in to start research,
so the Hagglund drivers gathered to the fray.

Those departing for Australia from the stations near and far,
had mustered nearby Casey overnight,
for ANARE loves new airstrips in the polar wilderness
where the penguins snuff the clear air with delight.

When the plane reached Casey’s air space, scientists looked below, doubtful,
it might well make the boldest hold their breath.

The compressed snow spread widely, but was hidden ice still full
of crevasses, and any slip was death?

But the Dassault Falcon pilot kept the aircraft in control,
he circled once then lowered landing gear,
then he touched down on the airstrip and braked safely to a stop,
while passengers clapped hands and gave a cheer.

They stepped down from the aircraft and were welcomed by the crowd
of scientists and staff with snow-clad faces.

Two other aircraft waited, their engines revving loud,
in readiness to fly to distant bases.

While the air was clear as crystal and the white sun was ablaze,
the Hobart plane was boarded straight away.

With no need to be refueled, the Falcon lifted off,
The fastest return flight was made that day.

Anon 2002

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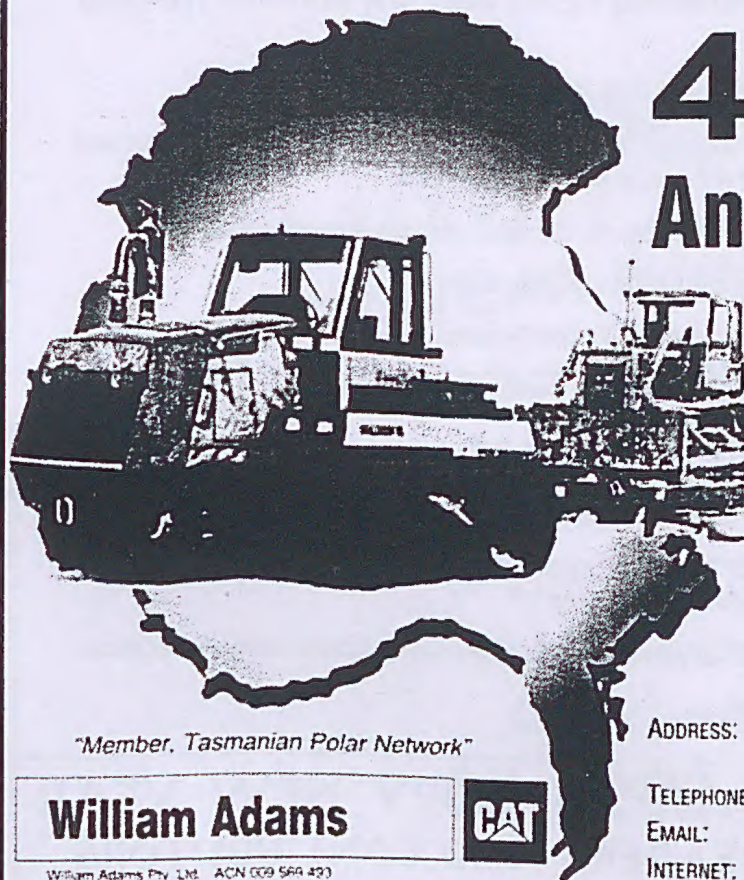
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POLAR CALENDAR



2-6	December	2002	16 th IAHR International Symposium on Ice. Dunedin, NZ. Contact: nzice@physics.otago.ac.nz
5-6	December	2002	NIPR Biology Symposium on 'Coccolithophorids in the Southern Ocean: Indicators of Change'. Tokyo, Japan.
6	December	2002	TPN meeting 1.00-2.30pm. Hotel Grand Chancellor, Hobart, Tas.
10-11	December	2002	Public lectures on the Australian Antarctic Program and Antarctic Marine Microbial Ecology. Mie University. Contact AAD for further details.
31	December	2003	Close of entries for the Southern Ocean Model-Making Competition. For further details and entry forms contact the Tasmanian Maritime Museum, phone 6234 1427 or write to GPO Box 118, Hobart, Tas. 7001
13-14	January	2003	Conference on Cryospheric Systems. Burlington House, London, UK Contact harrisc@cardiff.ac.uk
8-10	February	2003	Australian Wooden Boat Festival. Hobart, Tas. Contact: awoodenboatfest@trump.net.au
3	March	2003	6 th Antarctic Marathon and Half Marathon. Contact: marathon@shore.net
5-8	May	2003	IAATO meeting. Seattle, USA. Contact: iaato@iaato.org
25-30	May	2003	ISOPE-2003, 13 th International Offshore and Polar Engineering Conference Honolulu, Hawaii. Contact meetings@isope.org
29	May	2003	10 th Anniversary of the first meeting, organised by Peter Hodgman, of parties interested in forming a group which later became the Tasmanian Network.
	June	2003	Midwinter Festival activities. Hobart, Tas.
2-6	June	2003	International Symposium on Snow and Avalanches. Davos, Switzerland. Contact: www.spri.com.ac.uk/igs/home.htm
8-11	July	2003	COMNAP XV, Brest, France. Contact: jsayers@comnap.aq
9-20	July	2003	ATCM XXVI Meeting. Madrid, Spain.
13-17	July	2003	International Astronomical Union General Assembly. Sydney, NSW.
21-25	July	2003	8 th International Conference on Permafrost. Zürich, Switzerland. Contact: haeberli@gis.geogr.unizh.ch
25-29	August	2003	7 th International Symposium on Antarctic Glaciology (ISAG-7). Milan, Italy. Contact: isag7@unimib.it
18-25	September	2003	Conference on the future of South Georgia. Cambridge, UK. Contact: David.Rootes@poles.apart.org .
24	November	2003	Total solar eclipse. Queen Mary and Dronning Maud Land, Antarctica.

**MERRY CHRISTMAS AND A HAPPY NEW YEAR
TO ALL ICE BREAKER READERS AND CONTRIBUTORS**

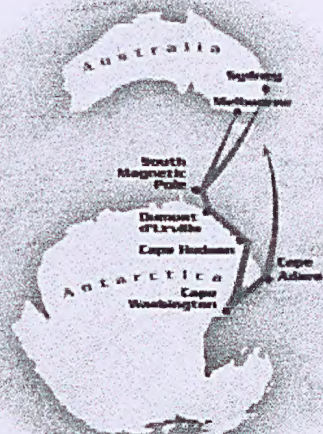
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ANTARCTIC AND SOUTHERN OCEAN SHIPPING CALENDAR

1	December	2002	SIR HUBERT WILKINS	Departs Hobart for Ross Sea area.
5-9	December	2002	AURORA AUSTRALIS V2	Davis Base.
5	December	2002	KAP. KHLEBNIKOV V2.1	Cape Denison.
9	December	2002	KAP. KHLEBNIKOV V2.1	Casey Base.
10-12	December	2002	AURORA AUSTRALIS V2	Sansom Island.
15	December	2002	KAP. KHLEBNIKOV V2.1	Davis Base.
15-19	December	2002	AURORA AUSTRALIS V2	Mawson Base.
17	December	2002	POLAR BIRD V3	Departs Hobart.
18	December	2002	L'ASTROLABE V2.2	Cape Denison.
20	December	2002	KAP. KHLEBNIKOV V2.1	Mawson Base.
21	December	2002	HANSEATIC V3.1	Departs Bluff, NZ.
23-24	December	2002	HANSEATIC V3.1	Macquarie Island.
26	December	2002	L'ASTROLABE V2.2	Arrives Hobart.
26	December	2002-		
1	January	2003	POLAR BIRD V3	Casey Base.
31	December	2002	AURORA AUSTRALIS V2	Arrives Hobart.
3	January	2003	AK. SHOKALSKI V4.1	Departs Hobart.
3	January	2003-		
9	February	2003	AURORA AUSTRALIS V4	Departs Hobart, Marine Science.
7	January	2003	AK. SHOKALSKI V4.1	Macquarie Island.
10	January	2003	POLAR BIRD V3	Arrives Hobart.
13	January	2003	POLAR BIRD V5	Departs Hobart.
15	January	2003	HANSEATIC V3.1	Arrives Ushuaia, Argentina.
15	January	2003	SIR HUBERT WILKINS	Arrives Hobart from Ross Sea.
26	January	2003-		
1	February	2003	POLAR BIRD V5	Mawson Base.
31	January	2003	AK. SHOKALSKI V4.1	Arrives Bluff, NZ.
1	February	2003	KAP. KHLEBNIKOV V2.1	Arrives Lyttleton, NZ, after circum- navigation of Antarctica.
3-4	February	2003	POLAR BIRD V5	Sansom Island.
9	February	2003	AURORA AUSTRALIS V4	Mawson Base.
5-7	February	2003	POLAR BIRD V5	Davis Base.
13-26	February	2003	AURORA AUSTRALIS V4	Marine Science.
19-20	February	2003	POLAR BIRD V5, V7	Arrives Hobart, departs Hobart.
25	February	2003	AK. SHOKALSKI V5.2	Departs Invercargill, NZ.
26-27	February	2003	AURORA AUSTRALIS V4	Davis Base.
1-2	March	2003	AK. SHOKALSKI V5.2	Macquarie Island.
1-4	March	2003	POLAR BIRD V7	Casey Base.
2-3	March	2003	AURORA AUSTRALIS V5	Mawson Base.
7	March	2003	AK. SHOKALSKI V5.2	Arrives Bluff, NZ.
13	March	2003	POLAR BIRD V7	Arrives Hobart. Off-hire.
15-17	March	2003	AURORA AUSTRALIS V5	Arrives Hobart, departs Hobart.
20-25	March	2003	AURORA AUSTRALIS V6	Macquarie Island.
28	March	2003	AURORA AUSTRALIS V6	Arrives Hobart. Off-hire.

For regular updates, see www.aad.gov.au/goingsouth